WHAT IS CLAIMED IS:

1. A process for recovering a composition enriched in tetramantane components and other higher diamondoid components which process comprises:
   a. selecting a feedstock comprising recoverable amounts of tetramantane components and other higher diamondoid components;
   b. removing a sufficient amount of components from the feedstock having a boiling point less than the lowest boiling point tetramantane component under conditions wherein recoverable amounts of tetramantane components and other higher diamondoid components are retained in the treated feedstock; and
   c. thermally treating the feedstock recovered in b) above to pyrolyze at least a sufficient amount of non-diamondoid components therefrom to permit recovery of tetramantane components and other higher diamondoid components from the pyrolytically treated feedstock wherein said pyrolysis is conducted under conditions to provide for a treated feedstock retaining recoverable amounts of tetramantane components and other higher diamondoid components.

2. A process for recovering a composition enriched in tetramantane components and other higher diamondoid components which process comprises:
   a. selecting a feedstock comprising recoverable amounts of tetramantane components and other higher diamondoid components, non-diamondoid components having a boiling point both below and above the lowest boiling point tetramantane component, and at least one lower diamondoid component;
   b. removing a sufficient amount of non-diamondoid components having a boiling point below the lowest boiling point tetramantane component as well as lower diamondoid components from the feedstock under conditions to provide a treated feedstock wherein tetramantane

components and other higher diamondoid components are retained therein; and

c. thermally treating said treated feedstock recovered in b) to pyrolyze at least a sufficient amount of non-diamondoid components therefrom to permit recovery of tetramantane components and other higher diamondoid components from the pyrolytically treated feedstock.

3. A process for recovering a composition enriched in tetramantane components and other higher diamondoid components which process comprises:

a. selecting a feedstock comprising recoverable amounts of tetramantane components and other higher diamondoids components;

b. thermally treating the feedstock to pyrolyze at least a sufficient amount of non-diamondoid components therefrom to permit recovery of tetramantane and other higher diamondoid components from the pyrolytically treated feedstock wherein said pyrolysis is conducted under conditions to provide for a treated feedstock retaining recoverable amounts of tetramantane components and other higher diamondoid components; and

c. removing a sufficient amount of those components from the feedstock surviving pyrolysis which components have a boiling point less than the lowest boiling point tetramantane component under conditions wherein recoverable amounts of tetramantane components and other higher diamondoid components are retained in the treated feedstock.

4. A process for recovering a composition enriched in tetramantane components and higher diamondoid components which process comprises:

a. selecting a feedstock comprising recoverable amounts of tetramantane components and other higher diamondoid components, non-diamondoid components, and at least one lower diamondoid component;

b. thermally treating said feedstock to pyrolyze at least a portion of the non-diamondoid components under conditions wherein recoverable amounts of tetramantane components and other higher diamondoid components are retained in said pyrolytically treated feedstock; and

c. removing a sufficient amount of lower diamondoid components from the pyrolytically treated feedstock under conditions to provide a treated feedstock from which tetramantane components and other higher diamondoid components can be recovered.

5. The process of Claims 2 or 4 wherein sufficient amounts of lower diamondoid components are removed from the feedstock to provide for a treated feedstock comprising a ratio of the amount of lower diamondoid components to higher diamondoid components of about 9:1 or less.

6. The process of Claim 5 wherein sufficient amounts of lower diamondoid components are removed from the feedstock to provide for a treated feedstock comprising a ratio of the amount of lower diamondoid components to the amount of higher diamondoid components of about 2:1 or less.

7. The process of Claim 6 wherein sufficient amounts of lower diamondoid components are removed from the feedstock to provide for a treated feedstock comprising a ratio of the amount of lower diamondoid components to the amount of higher diamondoid components of about 1:1 or less.

8. The process according to Claims 1 or 2 wherein at least about 10% of said tetramantane components and higher diamondoid components are retained in the feedstock after procedure (b) as compared to that amount of such components present prior to said procedure.

9. The process according to Claim 8 wherein at least about 50% of said tetramantane components and other higher diamondoid components are retained in the feedstock after procedure (b) as compared to that amount of such components present prior to said procedure.

10. The process according to Claim 9 wherein at least about 90% of said tetramantane components and other higher diamondoid components are retained in the feedstock after procedure (b) as compared to that amount of such components present prior to said procedure.

11. The process according to Claims 1, 2, 3 or 4 wherein at least about 10% of said tetramantane components and other higher diamondoid components are retained in the feedstock after pyrolysis as compared to that amount present prior to pyrolysis.

12. The process according to Claim 11 wherein at least about 50% of said tetramantane components and other higher diamondoid components are retained in the feedstock after pyrolysis as compared to that amount present prior to pyrolysis.

13. The process of Claims 1, 2, 3 or 4 wherein said feedstock comprises at least about 1 ppb of tetramantane components and higher diamondoid components.

14. The process of Claims 1, 2, 3 or 4 wherein removal of non-diamondoid components and/or lower diamondoid components from the feedstock comprises distilling said feedstock.

15. The process of Claim 14 wherein at least about 50 weight percent of the lower diamondoid components, based on the total weight of lower diamondoid components present in the untreated feedstock, is removed.

16. The process of Claims 1, 2, 3 or 4 which further comprises recovering tetramantane and other higher diamondoid components from the product of step c) by use of one or more separation techniques selected from the group consisting of chromatographic techniques, thermal diffusion techniques, crystallization, sublimation, and size separation techniques.

17. The process of Claim 16 wherein said separation technique is a chromatographic technique.

18. The process of Claim 17 wherein said chromatographic technique is selected from the group consisting of liquid chromatography, gas chromatography and high performance liquid chromatography.

19. The process of Claims 1, 2, 3 or 4 wherein the product of step c) comprises at least 10 weight percent of non-ionized tetramantane components and higher diamondoid components and at least 0.5 weight percent of non-ionized pentamantane components and higher diamondoid components based on the total weight of diamondoid components present.

20. The process of Claims 1, 2, 3 or 4 wherein the product of step c) comprises at least 10 weight percent of non-ionized tetramantane components and higher diamondoid components and at least 0.5 weight percent of non-ionized pentamantane components and higher diamondoid components based on the total weight of the recovered feedstock.

21. A process for recovering a composition enriched in tetramantane and pentamantane components which process comprises:

a. selecting a feedstock comprising recoverable amounts of tetramantane and pentamantane components;

b. removing a sufficient amount of components from the feedstock having a boiling point less than the lowest boiling tetramantane component under conditions to provide a treated feedstock from which tetramantane and pentamantane components can be recovered; and

c. recovering tetramantane and pentamantane components from said treated feedstock by separation techniques selected from the group consisting of chromatographic techniques, thermal diffusion techniques, zone refining, progressive recrystalization and size separation techniques.

22. A composition comprising at least tetramantane and pentamantane components wherein said composition comprises at least about 10 weight percent tetramantane components and at least 0.5 weight percent pentamantane components based on the total weight of diamondoid components present.

23. A composition comprising at least tetramantane and pentamantane components wherein said composition comprises at least about 25 weight percent tetramantane components and at least 0.5 weight percent pentamantane components based on the total weight of diamondoid components present.

24. A composition comprising at least tetramantane and pentamantane components wherein said composition comprises at least about 50 weight percent tetramantane components and at least 0.5 weight percent pentamantane components based on the total weight of diamondoid component present.

25. The composition of Claims 22, 23 or 24 wherein said compositions further comprise hexamantane.

26. A composition comprising at least tetramantane and pentamantane components wherein said composition comprises at least about 10 weight percent tetramantane

components and at least 0.5 weight percent pentamantane components based on the total weight of the composition.

27. A composition comprising at least tetramantane and pentamantane components wherein said composition comprises at least about 25 weight percent tetramantane components and at least 0.5 weight percent pentamantane components based on the total weight of the composition.

28. A composition comprising at least tetramantane and pentamantane components wherein said composition comprises at least about 50 weight percent tetramantane components and at least 0.5 weight percent pentamantane components based on the total weight of the composition.

29. The composition of Claims 26, 27 or 28 wherein said compositions further comprise hexamantane.

30. A process which comprises:

a. selecting a feedstock comprising recoverable amounts of a higher diamondoid component or components selected for recovery, nondiamondoid components and components having a boiling point less than the lowest boiling point higher diamondoid component selected for recovery;

b. removing from the feedstock a sufficient amount of components having a boiling point less than the lowest boiling point higher diamondoid component selected for recovery under conditions wherein recoverable amounts of the higher diamondoid component or components selected for recovery are retained in the treated feedstock; and

c. thermally treating the feedstock recovered in b) above to pyrolyze at least a sufficient amount of nondiamondoid components therefrom to permit recovery of the selected higher diamondoid component or components

from the pyrolytically treated feedstock wherein the pyrolysis is conducted under conditions to provide a treated feedstock retaining recoverable amounts of the selected higher diamondoid component or components.

31. A process for recovering a composition enriched in higher diamondoid components which process comprises:

a. selecting a feedstock comprising recoverable amounts of a selected higher diamondoid component or components, nondiamondoid components having a boiling point both below and above the lowest boiling point selected higher diamondoid component, and at least one lower diamondoid component;

b. removing a sufficient amount of lower diamondoid component and nondiamondoid components having a boiling point below the lowest boiling point selected higher diamondoid component as well as lower diamondoid components from feedstock under conditions to provide a treated feedstock wherein the selected higher diamondoid component or components are retained therein; and

c. thermally treating said treated feedstock recovered in b) to pyrolyze at least a sufficient amount of nondiamondoid components therefrom to permit recovery of the selected higher diamondoid components from the pyrolytically treated feedstock.

32. A process for recovering a composition enriched in a selected higher diamondoid component or components which process comprises:

a. selecting a feedstock comprising recoverable amounts of a selected higher diamondoid component or component, nondiamondoid components and components having a boiling point less than the lowest boiling point higher diamondoid component selected for recovery;

b. thermally treating said feedstock to pyrolyze at least a sufficient amount of nondiamondoid components under therefrom to permit recovery of the

selected higher diamondoid component or components from the pyrolytically treated feedstock wherein said pyrolysis is conducted under conditions to provide for a treated feedstock retaining recoverable amounts of the selected higher diamondoid component or components; and

c. removing a sufficient amount of those components from the feedstock surviving pyrolysis which components have a boiling point less than the lowest boiling point selected higher diamondoid component under conditions wherein recoverable amounts of the selected higher diamondoid component or components are retained in the treated feedstock.

33. A process for recovering a composition enriched in a selected higher diamondoid component or components which process comprises:

a. selecting a feedstock comprising recoverable amounts of a selected higher diamondoid component or components, nondiamondoid components and at least one lower diamondoid component;

b. thermally treating said feedstock to pyrolyze at least a portion of the nondiamondoid component under conditions wherein recoverable amounts of the selected higher diamondoid component or components are retained in said pyrolytically treated feedstock; and

c. removing a sufficient amount of lower diamondoid components from the pyrolytically treated feedstock under conditions to provide a treated feedstock from which the selected higher diamondoid component or components can be recovered.

34. A composition enriched in one or more selected higher diamondoid components, subject to the proviso that when there is only one selected higher diamondoid component it is not unsubstituted anti-tetramantane.

35. The composition of Claim 34 containing from 50 to 100% by weight of one or more selected higher diamondoid components.

36. The composition of Claim 34 containing from 70 to 100% by weight of one or more selected higher diamondoid components.

37. The composition of Claim 34 containing from 95 to 100% by weight of one or more selected higher diamondoid components.

38. The composition of Claim 34 containing from 99 to 100% by weight of one or more selected higher diamondoid components.

39. The composition of Claims 34-38 wherein the one or more selected higher diamondoid components are a single selected higher diamondoid component.

40. An enriched selected higher diamondoid component not including enriched unsubstituted anti-tetramantane.

41. The enriched selected higher diamondoid component of Claim 40 exhibiting a purity of at least 25%.

42. A process for recovering a composition enriched in one or more selected higher diamondoid components which process comprises:

a. selecting a feedstock comprising recoverable amounts of one or more selected higher diamondoid components and nonselected materials;

b. removing from the feedstock a sufficient amount of nonselected materials having boiling points less than the lowest boiling point selected higher diamondoid component under conditions to form a treated feedstock enriched in selected higher diamondoid components which can be recovered;

c. recovering a composition enriched in one or more selected higher diamondoid components from said treated feedstock formed in b) above with one or more additional separation techniques selected from the group consisting of chromatographic techniques, thermal diffusion techniques, zone refining, progressive recrystallization and size separation techniques.

43. A process for recovering a composition enriched in one or more selected higher diamondoid components which process comprises:

a. selecting a feedstock comprising recoverable amounts of one or more selected higher diamondoid components and nonselected materials including nondiamondoid components;

b. removing from the feedstock a sufficient amount of nonselected materials having a boiling point less than the lowest boiling point selected higher diamondoid component under conditions to form a treated feedstock enriched in selected higher diamondoid components which can be recovered;

c. thermally degrading said treated feedstock to pyrolyze at least a sufficient amount of nondiamondoid components therefrom under conditions to form a thermally treated feedstock retaining recoverable amounts of selected higher diamondoid;

d. recovering a composition enriched in one or more selected higher diamondoid components from said thermally treated feedstock formed in c) above with one or more additional separation techniques selected from the group consisting of chromatographic techniques, thermal diffusion techniques, zone refining, progressive recrystallization and size separation techniques.

44. A process for recovering a composition enriched in one or more selected higher diamondoid components which process comprises:

a. selecting a feedstock comprising recoverable amounts of one or more selected higher diamondoid components and nonselected materials including nondiamondoid components;

b. thermally degrading said feedstock to pyrolyze at least a sufficient amount of nondiamondoid components therefrom under conditions to provide a thermally treated feedstock retaining recoverable amounts of selected higher diamondoid;

c. removing from the thermally treated feedstock a sufficient amount of nonselected materials having a boiling point less than the lowest boiling point of selected higher diamondoid component under conditions to form a treated feedstock enriched in selected higher diamondoid components which can be recovered;

d. recovering a composition enriched in one or more selected higher diamondoid components from said treated feedstock recovered in c) above with one or more additional separation techniques selected from the group consisting of chromatographic techniques, thermal diffusion techniques, zone refining, progressive recrystallization and size separation techniques.

45. A process for recovering a composition enriched in one or more selected higher diamondoid components which process comprises:

a. selecting a feedstock comprising recoverable amounts of one or more selected higher diamondoid components and nonselected materials;

b. fractionating the feedstock to form one or more cuts enriched in materials having boiling points in the range of from just below the boiling point of the lowest boiling selected higher diamondoid component to just above the boiling point of the highest boiling selected higher diamondoid component;

c. recovering a composition enriched in one or more selected higher diamondoid components from said one or more cuts formed in b) above with one or more additional separation techniques selected from the group consisting of chromatographic techniques, thermal diffusion techniques, zone refining, progressive recrystallization and size separation techniques.

46. A process for recovering a composition enriched in one or more selected higher diamondoid components which process comprises:

a. selecting a feedstock comprising recoverable amounts of one or more selected higher diamondoid components and nonselected materials including nondiamondoid components;

b. fractionating the feedstock to form one or more cuts enriched in materials having boiling points in the range of from just below the boiling point of the lowest boiling selected higher diamondoid component to just above the boiling point of the highest boiling selected higher diamondoid component;

c. thermally degrading one or more cuts said to pyrolyze at least a sufficient amount of nondiamondoid components therefrom under conditions to form one or more thermally treated cuts retaining recoverable amounts of selected higher diamondoid;

d. recovering a composition comprising one or more selected higher diamondoid components from one or more said thermally treated cuts formed in c) above with one or more additional separation techniques selected from the group consisting of chromatographic techniques, thermal diffusion techniques, zone refining, progressive recrystallization and size separation techniques.

47. A process for recovering a composition enriched in one or more selected higher diamondoid components which process comprises:

a. selecting a feedstock comprising recoverable amounts of one or more selected higher diamondoid components and nonselected materials including nondiamondoid components;

b. thermally degrading said feedstock to pyrolyze at least a sufficient amount of nondiamondoid components therefrom under conditions to provide a thermally treated feedstock retaining recoverable amounts of selected higher diamondoid;

c. fractionating the thermally treated feedstock to form one or more cuts enriched in materials having boiling points in the range of from just below the boiling point of the lowest boiling selected higher diamondoid component to just above the boiling point of the highest boiling selected higher diamondoid component;

d. recovering a composition enriched in one or more selected higher diamondoid components from one or more cuts formed c) above with one or more additional separation techniques selected from the group consisting of chromatographic techniques, thermal diffusion techniques, zone refining, progressive recrystallization and size separation techniques.